

CLAIMS:

1. A tire condition monitoring apparatus for monitoring a condition of a vehicle tire, comprising:

5 a transmitter, which is located in the tire and activated by a battery, wherein the transmitter includes:

a tire condition sensor for detecting the condition of the tire;

10 a transmission circuit for wirelessly transmitting data representing the tire condition;

a voltage sensor, which detects a voltage of the battery; and

15 an electricity control circuit, wherein, during a period from when the tire condition sensor detects the condition of the tire to when the transmission circuit starts transmitting the data, the electricity control circuit performs a transmission preparation process to gradually increase electricity supplied to the transmission circuit from the battery, thereby
20 gradually increasing a radio wave output of the transmission circuit, and wherein, if the value of the voltage detected by the voltage sensor is lowered to a lowest operation voltage of the transmitter during the transmission preparation process, the electricity
25 control circuit limits the supply of electricity to the transmission circuit from the battery; and

a receiver, which is located in a body of the vehicle and receives data from the transmitter.

30 2. The tire condition monitoring apparatus according to claim 1, wherein the transmission circuit transmits data representing the voltage of the battery in addition to the data representing the condition of the tire, wherein, when the supply of electricity to the transmission circuit is
35 limited, the transmission circuit transmits data representing

the lowest operation voltage as the data representing the voltage.

3. The tire condition monitoring apparatus according to
5 claim 1, wherein, if the value of the radio wave output reaches a predetermined value before the value of the voltage detected by the voltage sensor is lowered to the lowest operation voltage, the transmission circuit performs
10 transmission at a radio wave output of the predetermined value.

4. The tire condition monitoring apparatus according to claim 1, wherein, if the value of the voltage detected by the voltage sensor reaches the lowest operation voltage before
15 the value of the radio wave output reaches a predetermined value, the transmission circuit performs transmission at a radio wave output that is less than the predetermined value.

5. The tire condition monitoring apparatus according to
20 claim 2, wherein the transmission circuit transmits a data frame for a plurality of consecutive times, the data frame containing data representing the condition of the tire and data representing the value of the voltage.

25 6. The tire condition monitoring apparatus according to claim 1, wherein, when the vehicle is not moving, the tire condition sensor stops detecting data representing the condition of the tire.

30 7. A transmitter, which is located in a tire of a vehicle and activated by a battery, the transmitter comprising:

a tire condition sensor for detecting the condition of the tire;
35 a transmission circuit for wirelessly transmitting data

representing the tire condition;

a voltage sensor, which detects a voltage of the battery; and

an electricity control circuit, wherein, during a
5 period from when the tire condition sensor detects the
condition of the tire to when the transmission circuit starts
transmitting the data, the electricity control circuit
performs a transmission preparation process to gradually
increase electricity supplied to the transmission circuit
10 from the battery, thereby gradually increasing a radio wave
output of the transmission circuit, and wherein, if the value
of the voltage detected by the voltage sensor is lowered to a
lowest operation voltage of the transmitter during the
transmission preparation process, the electricity control
15 circuit limits the supply of electricity to the transmission
circuit from the battery.

8. The transmitter according to claim 7, wherein the
transmission circuit transmits data representing the voltage
20 of the battery in addition to the data representing the
condition of the tire, wherein, when the supply of
electricity to the transmission circuit is limited, the
transmission circuit transmits data representing the lowest
operation voltage as the data representing the voltage.

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9. The transmitter according to claim 7, wherein, if
the value of the radio wave output reaches a predetermined
value before the value of the voltage detected by the voltage
sensor is lowered to the lowest operation voltage, the
30 transmission circuit performs transmission at a radio wave
output of the predetermined value.

10. The transmitter according to claim 7, wherein the
transmission circuit transmits a data frame for a plurality
35 of consecutive times, the data frame containing data

representing the condition of the tire and data representing the value of the voltage.

11. A transmitter, which is located in a tire of a
5 vehicle and activated by a battery, the transmitter comprising:

a tire condition sensor for detecting the condition of the tire;

a transmission circuit for wirelessly transmitting data
10 representing the tire condition;

a voltage sensor, which detects a voltage of the battery; and

an electricity control circuit, wherein, after the tire condition sensor detects the condition of the tire, the
15 electricity control circuit gradually increases electricity supplied to the transmission circuit from the battery, thereby gradually increasing a radio wave output of the transmission circuit, and wherein, if the value of the voltage detected by the voltage sensor reaches a lowest
20 operation voltage before the value of the radio wave output reaches a predetermined value, the electricity control circuit limits the supply of electricity to the transmission circuit from the battery, such that the transmission circuit performs transmission at a radio wave output that is less
25 than the predetermined value.